



**Use and Limitation of this Guidance:** The Sponsor may use this document as a guide in preparing a construction observation program that is specific to their project. We caution Sponsors and Consultants that our provision of this suggested sample construction observation program by the FAA does not guarantee their compliance with grant obligations. The Sponsor is solely responsible for the preparing and submitting a compliant construction observation program that is specific to their project.

## **(Sample DRAFT PROGRAM)** Construction Observation Program

**Date**

**(Location)**  
**(Project Name)**  
**(AIP Project Number)**

**Prepared For**

**Prepared By**

## PROJECT INFORMATION

This Construction Observation Program (COP) details the measures and procedures required to assure compliance with the quality control and acceptance provisions of the paving construction contract for AIP Project No. \_\_\_\_-\_\_\_\_-\_\_\_\_-\_\_\_\_ at the (airport name), (city, State). The work to be accomplished in this project consists of:

- 1) *(List major project work items)*
- 2) *(List major project work items)*
- 3) *(List major project work items)*

PROJECT SPONSOR:	<i>(name &amp; contact information for sponsor )</i>
CONTRACT ADMINISTRATION:	<i>(Name of firm Responsible for Const. Observation &amp; QA testing)</i> <u>(NAME)</u> _____, Project Manager (# years Earthwork) (# years Base/Subbase) # years experience Pavement Const) <u>(NAME)</u> _____, Asst Project Manager (# years Earthwork) (# years Base/Subbase) (# years experience Pavement Const) <u>(NAME)</u> _____, Construction Observer (# years Const. Observation) <u>(NAME)</u> _____, Construction Observer (# years Const. Observation)
CONTRACTOR:	<i>(Name of Contractor, contact information and name of superintendent)</i>
ACCEPTANCE TESTING FOR GRADING, SUBGRADE & BASE	<i>(Name of QA firm)</i> – Field tests <i>(Name &amp; contact info for QA lab)</i> – Lab tests
ACCEPTANCE TESTING FOR PAVEMENT	<i>(Name &amp; contact info for QA lab)</i> – Lab tests
CONTRACTORS QUALITY CONTROL TESTING LAB	<i>(Name &amp; contact info for QC lab)</i> – Lab tests

## RESPONSIBILITIES

### ***Project Manager***

***(Name of Project Manager / Engineer)*** , on behalf of ***(Name of CO Firm)*** represents the sponsor as the person with overall responsibility for contract administration of this project. ***(Name of Project Manager / Engineer)*** has the authority to take the necessary actions to monitor the compliance with the contract documents. ***(Name(s) of Assistant Project Managers)***, shall assist ***(Name of Project Manager / Engineer)*** with the contract administration of this project, as Assistant Project Managers.

### ***Construction Observer***

The responsibilities of ***(Name of Construction Observer)***, Construction Observer, shall include monitoring all aspects of the job, sampling materials for acceptance, conducting tests on embankment and excavation areas, reviewing and analyzing all test results, assuring that work is within specification limits, advising the Contractor's Superintendent and Project Engineer of nonconformance and possible corrective actions, and measuring quantities for payment.

### ***Quality Acceptance Lab***

***(As appropriate clarify which firm is responsible for what QA duties)***, testing lab duties shall include sampling materials for acceptance and conducting tests on: ***(embankment, excavation, subbase, base, HMA, PCC)***. ***(If responsibilities for testing of materials split between different organizations list which firm is responsible for which QA tests)***

***(QA Lab name)*** personnel assigned to construction testing have received certified training from the ***(Name of appropriate personnel certifications)*** (e.g. Troxler Nuclear Equipment Seminar and the American Concrete Institute (ACI)).

All QA testing shall be performed by an ASTM accredited laboratory and a copy of the current accreditation shall be supplied to the Engineer and Owner, for approval, prior to submitting test results.

Laboratory accreditations for ***(Name of QA firms)*** and resumes of personnel are attached in Exhibit A.

### ***Additional Personnel***

In addition to those listed above, additional ***(Additional personnel assigned to assist with construction observation)*** may be assigned to assist with construction observation, when necessary.

## INSPECTION PROCEDURES

1. A list of tests required by the contract specifications can be found in the attached Exhibit B. The list includes the referenced specification section, responsible party and testing requirements. All parties will be informed of their responsibilities. This information will be reviewed at the preconstruction conference and monitored throughout the project. The engineer shall maintain a file containing certifications and submittals provided by the contractor, as well as approvals from the Engineer.
2. The Project Manager or Assistant Project Manager will be on site at the beginning of the placement of the: **(subbase, base course, asphalt base course, asphalt surface course, and concrete pavement placement)** for the **(runway, taxiway and apron)** initial installation **of (runway lights, taxiway lights, PAPI's, work in electrical vault)** and prior to and during initial installation of **(runway / taxiway)** markings.
3. **(Names of firm(s) responsible for QA test reports)** will provide acceptance test reports to the contractor as soon as the results are available.
4. Material Test Reports: Material test results shall be verbally made available to the contractor and the engineer within **( one hour )** after the test report is completed and typed copies shall be made available within one working day **( delivered via electronic mail)**.
5. Test Reports Which Require Corrective Actions: Should test results or observations indicate noncompliance with the project contract, plans, or specifications the following communication and follow-up action will be implemented, as applicable:
  - Verbal notification to the Construction Superintendent, work area foreman and/or plant operator.
  - Calibration check on equipment used to determine the noncompliance item, if applicable.
  - Confirmation of noncompliance through retesting and/or follow-up observations.
  - If a solution to the nonconformance issue is not reached in a reasonable time frame, additional qualified contractor personnel will be contacted to assist in identifying and correcting the problem.
  - If a severe nonconformance problem is detected and a reasonable solution cannot be implemented in a reasonable time frame, the Construction Superintendent will consult with the Project Engineer and the work detail will be suspended.
  - The work detail will commence only after the Construction Superintendent and Project Engineer concur that a solution to the problem has been found and successfully implemented.
  - Upon work commencement the nonconforming testing element or observation will be monitored at an appropriate high frequency for a reasonable amount of time, e.g. double the testing frequency listed.

- After the area in question has been repaired, acceptance retesting will resume. The test reports will include failed test number for tracking.
6. Daily Reports: The project manager shall assure that a daily diary will be maintained summarizing pertinent construction items. Items recorded shall include (as a minimum)
    - a) Date
    - b) Weather Conditions
    - c) Brief Summary of Work Performed
    - d) Number of workers on site
    - e) Type and Amount of Major Equipment being utilized
    - f) Running total of working/calendar days used on project
    - g) Significant Directives/Communication with contractor (e.g. regarding construction procedures or material quality)
    - h) Summary of QA tests performed that day
    - i) Arrival / Departure Time On Site Inspection Staff
  7. Weekly Reports: A summary of weekly construction status shall be prepared weekly (on FAA form 5370-1) and submitted to **(owner / FAA)** every **(list day, e.g. Friday)** Report shall include summary of work completed that week, summary of QA test results, discussion of any controversial issues that came up, work anticipated next reporting period.
  8. Submittal Schedule: The attached Exhibit C lists required submittals, referencing the pay item, description, and specification section for the submittal. All required submittals will be reviewed and approved by the Engineer prior to placement of the material.
  9. **(Name of firm doing surveys)** will provide survey staking for horizontal and vertical control. The contractor's survey staking will be reviewed by the resident observer and approved prior to placement of materials.
  10. The finish grade of **(Runways / Taxiways )** will be verified by the **(contractors / owners)** licensed surveyor. The documentation shall be provided to the owner prior to the final acceptance of the subject pavement.
  11. The resident observer and acceptance testing lab personnel shall maintain all acceptance test reports and provide copies to the contractor as soon as results are available.
  12. **(Name of firm responsible for final construction report)** will prepare a final project construction material testing and acceptance report that includes a summary of: all acceptance tests results, quantity of materials, and all weekly reports. (Actual test reports will be available upon request).

## APPENDIX "A"

### Resumes and Lab Certifications

*(Include resumes or summary of experience that clearly shows the pavement construction experience of the inspection staff, see following pages for minimum recommended experience levels for various project personnel)*

#### **(Name of Project Manager) Project Manager**

**EDUCATION:** (year) BS\_\_ (name of school)

**REGISTRATIONS:** Registered Engineer (*List states registered in*)

**CERTIFICATIONS:** (E.G. ACI Concrete Field Testing – Grade I  
(NDOR Concrete Field Inspector Level I  
(KDOT Certified Inspector #\_\_\_\_\_)

**PAVEMENT CONSTRUCTION EXPERIENCE:** (*# years experience in all phases of airport pavement construction or pavement construction as appropriate*)

\_\_\_ Yrs Earthwork, Subbase & Base Construction  
\_\_\_ Yrs. Concrete Paving  
\_\_\_ Yrs. Bituminous paving

#### **(Name of Construction Observer)**

**EDUCATION:** (year) (Degree) (name of school)

**REGISTRATIONS:** Registered Engineer (*List states registered in*)

**CERTIFICATIONS:** (E.G. ACI Concrete Field Testing – Grade I  
(NDOR Concrete Field Inspector Level I  
(KDOT Certified Inspector #\_\_\_\_\_)

**PAVEMENT CONSTRUCTION EXPERIENCE:** (*# years experience in all phases of airport pavement construction or pavement construction as appropriate*)

\_\_\_ Yrs Earthwork, Subbase & Base Construction  
\_\_\_ Yrs. Concrete Paving  
\_\_\_ Yrs. Bituminous paving

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## **Minimum recommended qualifications for oversight staff**

### **Project Engineer/Manager:**

The Project Engineer/Manager shall be a Professional Engineer, licensed in the state where construction takes place (or a reciprocal state), and shall have overall responsibility for construction observation of the project.

The engineer must be on the project site at the beginning of any critical operations and shall supervise all additional construction observation personnel. Critical operations shall be specifically defined in the Construction Observation Program (COP).

The engineer shall have authority to make decisions regarding the project, subject to approval of the sponsor/owner and the FAA. Official project documents (i.e. change orders, inspection reports, etc.) shall always be signed by the Project Engineer.

Unless otherwise approved by the FAA, the Project Engineer shall meet the following minimum requirements:

Earthwork - 3 years experience in earthwork construction.

Base and Subbase - 3 years experience in base and subbase construction

Concrete or Asphalt - 5 years experience in airport or highway pavement construction.

### **Resident Observer**

The engineering consulting firm may supplement the Project Engineer with a resident observer. The use of a Resident Observer does not diminish the responsibility of the Project Engineer. The Project Engineer must be present at the start of all critical operations to assure contractor compliance. The Resident Observer may assist the Project Engineer with construction observation but shall not assume the overall responsibility of the Project Engineer. The qualifications for construction observation personnel will vary depending upon the material being placed, however a minimum of two years experience is recommended. Consult the minimum standards for materials to ascertain the minimum qualifications for the resident observer.

### **Field Testing Personnel**

Unless otherwise specified, field-testing personnel shall have a minimum of one-year experience in field-testing of the material being placed or constructed. In lieu of working experience, a certificate of completion from an acceptable training course may be accepted subject to FAA approval.

### **Laboratory Personnel**

The supervisors of the main testing laboratory and field laboratory shall have as a minimum; two years of prior employment with the official project testing laboratory or other testing laboratories with approved accreditation. The supervisor is ultimately responsible for the testing activity, but need not be present for field sampling or field-testing.

### **Testing Laboratory**

The laboratory furnishing testing services for the project shall be tested for proficiency by a nationally recognized accreditation program i.e. AASHTO, NVLAP or A2LA. If a testing laboratory can show evidence that it has applied for and paid necessary fees to an acceptable laboratory accreditation program, such

evidence may on an interim basis, satisfy this requirement. The laboratory shall only be required to have accreditation for tests required in the project.

Testing functions occurring in the field such as density testing, material sampling, or specimen preparation may be performed by accredited laboratory personnel or other qualified personnel. Field-testing personnel shall have as a minimum, one year of experience with the appropriate material and construction methods.

### **Surveying**

The surveying included in this portion of the observation program is limited to that required for construction of the project. All field notes and data collected during design should be made available to the Project Engineer regardless of who designs the project. The survey party shall consist of a qualified party chief and survey crew. All survey equipment shall be verified for proper working operation prior to use. If property surveying is required, the party chief shall be a registered land surveyor.

Horizontal and Vertical Control: Per Section 50-06 of AC 150/5370-10, the Sponsor's engineer shall be responsible for establishing horizontal and vertical control. Occasional spots shall be required to assure the integrity of the control monuments. Due to accuracy requirements for aeronautical information, the construction monuments for runway projects shall be tied into the National Geodetic Service (NGS) survey Datums. For horizontal control, the referenced datum shall be NAD83. For vertical control, the referenced datum shall be NAVD88. The construction monuments shall be adequately protected throughout the duration of the project.

Construction Layout and Staking: The Contractor shall accomplish construction layout and staking by using horizontal and vertical control monuments established by the Sponsor's surveyor. The Sponsor shall avoid situations that use the engineering consultant to accomplish construction layout and staking. The responsibility and risk associated with construction layout and staking shall remain with the Contractor.

During the course of the project work, the Sponsor's survey party shall make spot checks on alignment, verify proper cross sections of the completed pavement layers (subgrade, subbase, base course and surface course) and verify final cross sections for computing final pay quantities. Prior to final acceptance of Runways and Taxiways the contractor shall provide documentation signed by a licensed surveyor of levels at 50' intervals plus all breaks in grade.



## **Subgrade, Subbase, and Base Course Construction Personnel**

### **Field Construction Observer:**

The Sponsor's Engineer shall provide at least one on site construction observer per shift with a minimum of 2 years experience in earthwork, and aggregate subbase/ base course construction. Subject to FAA approval, a four-year college degree in engineering or a certificate of completion from an acceptable training course may be substituted for up to one year of experience. If additional assistant construction observers are required they shall have a working knowledge of earthwork and subbase/base coarse construction procedures.

### **Field Testing Personnel:**

Unless otherwise specified, field testing personnel shall have a minimum of one year experience in field testing of subgrade, subbase, and base courses. In lieu of working experience and subject to FAA approval, a certificate of completion from an acceptable training course may be accepted.

### **Laboratory Personnel:**

The supervisor(s) of the main testing laboratory and field laboratory shall have as a minimum; two years of prior employment with the official project testing laboratory or other testing laboratories with approved accreditation. The supervisor is ultimately responsible for the testing activity, but need not be present for field sampling or field testing.

## **Bituminous Paving Observation Personnel**

### **Field and Plant Inspectors:**

The Sponsor's Engineer shall furnish a sufficient number of observers to adequately observe plant and field lay down operations. A minimum of one on site observer per shift shall have at least five years of experience in the field of bituminous pavement construction. Subject to FAA approval, a four-year college degree in engineering or a certificate of completion from an acceptable training course may be substituted for up to one year of experience. Additional assistant observers must have a working knowledge of the appropriate construction procedures. This includes observers for construction of bituminous seal coats and surface courses.

### **Field Testing Personnel:**

Unless otherwise specified, field-testing personnel shall have a minimum of one year experience in field testing and sampling of bituminous concrete. In lieu of working experience and subject to FAA approval, a certificate of completion from an acceptable training course may be accepted.

### **Laboratory Personnel:**

The supervisor(s) of the main laboratory and field laboratory shall have a minimum of two years of supervisory employment with this laboratory or other laboratories with approved accreditation.

Additional laboratory personnel shall have a working knowledge of bituminous mixture testing. The supervisor is ultimately responsible for the testing activity, but need not be present for field sampling or field testing.

## **Concrete Paving and Structural Concrete Observation Personnel**

### **Field Observers:**

The Sponsor's Engineer shall furnish a sufficient number of observers to adequately observe plant and field placement operations. A minimum of one on site observer per shift shall have at least 5 years experience in concrete pavement construction. Subject to FAA approval, a four year college degree in engineering or a certificate of completion from an acceptable training course may be substituted for up to one year of experience. The observer shall be on site during the placing, initial sawing and initial curing operations. Additional assistant observers shall have a working knowledge of concrete paving procedures.

### **Field Testing Personnel:**

Unless otherwise specified, field-testing personnel shall have a minimum of one-year experience in field testing and sampling of portland cement concrete. In lieu of working experience and subject to FAA approval, a certificate of completion from an acceptable training course may be accepted.

### **Testing Laboratory Personnel:**

The supervisor of the main laboratory and field laboratory shall have a minimum of two years of employment with this laboratory or other laboratories that have approved accreditation. Additional laboratory personnel shall have a working knowledge of concrete testing. The supervisor is ultimately responsible for the testing activity, but need not be present for field sampling or field-testing.

## **Manufactured Materials**

For manufactured items such as cement, asphalt, steel, lime, flyash and etc., the Project Engineer may accept the vendor's certification that the materials meet the specifications or may require the material to be tested for compliance to the specifications.

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## APPENDIX "B"

### List of Tests

Include listing of all QC/QA tests required by the contract specifications

Recommend including the following information in your listing

- Specification Section
- Responsibility: Whom is responsible for doing the test
- Specification reference paragraph
- Material
- Test Required
- Sampling location
- Frequency
- Test Requirements
- ASTM procedure
- Notes

Sample section for P152

Specification	Responsibility	Specification Reference	Material	Tests Required	Sampling Locations	Minimum Test Frequency	Requirements	Test Procedure	Notes
P-152 Excavation & Embankment	QA CONSULTANT	152-2.2e	Excavation and Embankment	Moisture / Density Relations	In-place	1 per 350 SY		ASTM D 2922, D 1556, or D 2167	
	QA CONSULTANT	152-2.6	Structural Fill	Proof roll	In Place	all areas with structural fill		Rubber-tired equipment weighing at least 25 tons	
	QA CONSULTANT	152-2.6, Table 152-1	Pavement Soil Subgrade: 0"-8" below the base of the P-209 Granular subbase	Density & Moisture	In-place	1 per 750 CY	98% density; -2% to +2% of Optimum	ASTM D 2922, D 1556, or D 2167	Results in Final Report
	QA CONSULTANT	152-2.6, Table 152-1	Structural Fill placed below the base of the Pavement Soil Subgrade	Density & Moisture	In-place	1 per 750 CY	95% density; -2% to +2% of Optimum	ASTM D 2922, D 1556, or D 2167	Results in Final Report
	QA CONSULTANT	152-2.6, Table 152-1	Utility trenches within building and pavement areas	Density & Moisture	In-place	1 per 750 CY	98% density; -2% to +2% of Optimum	ASTM D 2922, D 1556, or D 2167	Results in Final Report
	QA CONSULTANT	152-2.6, Table 152-1	Embankment beneath landscaped or grass areas	Density & Moisture	In-place	1 per 750 CY	92% density, moisture as needed to obtain density	ASTM D 2922, D 1556, or D 2167	Results in Final Report
	QA CONSULTANT	152-2.9	Areas under subbase	Grade Tolerance	In-place		≤ 1/2" deviation (using 16' straight-edge); +/- 0.05' from true grade	Straightedge; Survey Results	
	QA CONSULTANT	152-2.9	Safety areas	Grade Tolerance	In-place		+/- 0.10' from true grade	Survey Results	
P-209 Crushed Aggregate Base Course	Contractor or certified state test results	209-2.1	Aggregate	Blast Furnace Slag	Source	One per source	Unit Weight > 70 lbs/cf	ASTM C 29	

## **APPENDIX “C”**

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### List of Submittals